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Applying Game-Based Approaches in Personnel Selection: a Systematic Literature Review

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Abstract: Gamification has expanded dramatically in the field of human resource management in recent years. Research that has examined the influence of gamification on changes in candidates' perceptions of personnel selection is still expanding, as the majority of academic work in gamification is related to the field of education. This paper aims to investigate how job seekers perceive selection assessment tools based on gamification through a systematic review. The systematic review contains articles published between 2010 and 2022 and indexed in five databases. In the first stage, 5260 articles are included in our search. We chose as exclusion criteria articles published before 2010, references other than journal articles, reviews, and conference articles. Furthermore, we excluded articles published in languages other than English and French, off-topic articles. After assessing all the references, we selected 21 articles following PRISMA statement. The results highlighted 21 scientific articles covering the following themes: candidates' reactions to gamification tools and serious games, candidates' reactions to gamified selection tests, advantages and limits of gamification, and the performance level of candidates regarding the use of gamification. Limitations and implications for future research were discussed.

Keywords: game-based approaches (GBA); gamification; selection; recruitment; candidates; systematic review.

Introduction

In the current context, characterized by various technological changes, companies have started to include game-based approaches (GBA) in their recruitment strategy to recruit and select the required profiles. Game-based approaches (GBA) include several concepts, such as gamification, gamified assessment, and game-based assessment. *Gamification* is defined as "the use of game mechanics in non-game contexts" (Armstrong et al., 2016; Deterding et al., 2014; Melchers & Basch, 2021; Woźniak, 2015). A non-game context refers to any domain that does not include the application of game elements, such as human resource management, education, and healthcare. In the context of personnel selection, gamification is the implementation of game mechanisms in the recruitment and personnel selection process in order to improve the attractiveness of the recruitment process and, therefore, make candidates more involved and engaged (Akoodie, 2020; Iseli et al., 2010; Levy, 2013; Montefiori, 2016). Game mechanics include points, badges, levels, rewards, challenges, etc.

Gamified assessments include game elements and create an immersive game environment. In gamified assessments, the psychometric principles remain unchanged, but the inclusion of game mechanics makes the assessment appear like a game. When the inclusion of game mechanics is done correctly, candidates' reactions tend to be more

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positive, and the inclusion of game mechanics reduces the stress and anxiety levels of the candidates and mitigates cheating behaviors (Akoodie, 2020; Attali & Arieli-Attali, 2015; Beck, 1992; Collmus & Landers, 2019; Gangadharbatla & Davis, 2016; Georgiou, Gouras, & Nikolaou, 2019; Lacroux & Martin-Lacroux, 2021; Mavridis & Tsiatsos, 2017).

The third concept is game-based assessment. It represents a complete change in the evaluation model. Games lend themselves well to evaluation since they give players various choices during the game. Recording player choices and game para data enables a game-based assessment to analyze information that is difficult to access with traditional assessment tools (Landers, 2014; Ventura & Shute, 2013). While gamified assessments present traditional assessment tools in a new format, game-based assessment reconstructs assessment as a game as candidates interact with game elements (Landers, Auer, & Abraham, 2020, p. 2).

Gamification is used in several areas of the HR function, especially in the field of learning in order to make the learning process of employees more fun and, lately, in the field of recruitment and personnel selection (Stanescu, Ioniță, & Ioniță, 2020, p. 268). Currently, the existing literature is characterized by a scarcity of empirical research examining candidates' reactions and perceptions of fairness towards game-based approaches, given that this field of research is still new.

In addition, the number of systematic reviews (SLRs) published in this area of research is minimal, making it worthwhile to conduct a critical review to assess the existing literature on this area of research. The two published systematic reviews examined the application of gamification in recruitment and selection, except that the first review was based solely on two databases for reference collection. In contrast, the second review focused on recruitment and professional training without providing a clear insight into candidates' reactions to game-based approaches.

In this research work, the focus is on the weaknesses of these two systematic reviews by expanding the scientific database with a focus on candidates' reactions and perceptions towards game-based approaches. The underlying intention is to highlight the challenges associated with the application of gamification in the field of personnel selection and provided a comprehensive synthesis of candidates' reactions and perceptions of fairness towards game-based approaches and their predictive validity, benefits, and limitations of applying gamification in the context of personnel selection and candidates' level of performance towards the use of gamification.

To address the research gaps and provide a comprehensive and recent review on the application of gamification in the personnel selection field, this review evaluates the existing literature on this research area from 2010 to 2022. The purpose of this systematic review is to: (1) analyze and evaluate research that has examined the use of gamification tools in the context of personnel selection and (2) propose research directions as a result.

Literature review

Organizational justice model

"Organizational justice" was invented by Greenberg in 1987 and corresponds to individuals' perceptions of justice within organizations (Colquitt, Greenberg, & Zapata-Phelan, 2005; Marzucco & Hansez, 2013). In 1993, Gilliland presented a model of organizational justice specific to the personnel selection context. Several researchers have examined this model in-depth in several contexts.

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Gilliland's (1993) model integrates theories of organizational justice and previous work on candidate reactions to define rules and dimensions of justice appropriate to different selection situations (Arvey & Sackett, 1993; Schuler, 1993). The respect or violation of these rules would form perceptions of justice, which will lead to consequences for the attitudes, intentions, and behaviors of applicants.

In the organizational context, justice was measured on the basis of Colquitt's (2001) scale constructed through Leventhal's (1980) rules of procedural justice and Bies and Moag's (1986) rules of interactional justice, while the measurement of applicants' perceptions of justice in the personnel selection context was constructed through Gilliland's (1993) organizational justice model.

In Gilliland's (1993) famous model, distributive and procedural justice are conceptualized as rules/dimensions that influence the degree to which these dimensions are perceived to be respected or violated. Violation or respect of these dimensions leads to the formation of an overall perception of fairness of the selection process or the selection decision itself. Violation of the rules of procedural and distributive justice leads to perceptions of unfairness and negative reactions from applicants.

In addition to the main effects of Gilliland's (1993) model, it also presents interactions between the rules of distributive and procedural justice that also contribute to the formation of perceptions of fairness of the process and the selection decision. These perceptions, in turn, lead to individual and organizational consequences (Marzucco & Hansez, 2013, p. 48).

Gilliland (1993, pp. 703-710) presented ten rules of procedural justice that form positive or negative perceptions of justice based on whether they are perceived as respected or violated. *Job relatedness* is divided into two rules: face validity and predictive validity. Face validity refers to whether the content of a selection test is consistent with the characteristics of the job, whereas predictive validity refers to whether performance during the selection process, as measured by a selection test, is predictive of actual job performance. *Opportunity to perform*: refers to the opportunity given to the candidate to demonstrate their competencies in a selection situation or to exercise control in a selection situation. This rule is known as "the voice". *Reconsideration opportunity*: refers to the opportunity for the applicant to disagree with or modify a selection decision that has been made. *Consistency of administration*: involves ensuring that the selection and decision procedures are standardized and consistent over time. *Feedback*: involves giving argumentative feedback to candidates on both their performance and the selection decision made (Gilliland, 1993, p. 705). *Selection information*: involves communicating, informing, and explaining the selection procedures to candidates. *Honesty*: refers to the recruiter's honesty in their exchanges with the candidates (Marzucco & Hansez, 2013, p. 48). *Interpersonal effectiveness of administrator*: involves ensuring that candidates are treated respectfully during the selection process (Marzucco & Hansez, 2013, p. 48). *Two-way communication*: involves taking into account the opinions and views of the candidates during the test or selection process. *Propriety of questions*: the recruiter should not ask discriminatory questions during the selection process. The questions asked should only be related to the requirements of the position (Bies & Moag, 1986; Steiner & Gilliland, 1996).

Gilliland (1993) also proposed two other rules of procedural justice, which are: Ease of faking answers (refers to the ability to falsify information in a socially desirable way) and Invasion of privacy (the selection tools implemented by the employer should not affect the privacy of the candidates, in terms of content or administration) (Kravitz, Stinson, & Chavez, 1996, p. 25). Gilliland (1993, pp. 715-720) proposed three rules of distributive

justice that contribute to the formation of perceptions (positive or negative) of candidates depending on whether they are perceived to be respected or violated. It is worth noting that the satisfaction of one distributive rule will automatically lead to the violation of another distributive rule (Marzucco & Hansez, 2013, p. 49).

The three rules of distributive justice cited by Gilliland (2013) are: equity: ensuring that decisions made during the selection process are fair and based on objective criteria, such as qualifications and experiences; equality: involves ensuring that the hiring decision is based on the candidate's skills, rather than gender or race; needs: ensuring that rewards are distributed based on the needs of each individual.

Laumer, Eckhardt and Weitzel (2012) conducted a study in Germany to examine applicants' reactions to the use of serious games by companies. Based on 1882 German participants who participated in an online survey, the authors investigated the impact of the "invasion of privacy" dimension on shaping applicants' perceptions of justice. The authors argue that perceptions of privacy invasion resulting from the use of serious games do not impact participants' perceptions.

Furthermore, Ellison, McClure Johnson, Tomczak, Siemsen and Gonzalez (2020) conducted a study in the United States with a sample of 374 participants. The purpose of this study was to examine applicants' perceptions and reactions to gamification tools based on the organizational justice model (Gilliland, 1993). The dimensions of procedural justice examined were primarily face validity, predictive validity, opportunity to perform, and selection information. The authors found a high mediating effect of justice perceptions on the relationship between perceptions of all procedural justice rules (except for opportunity to perform) and applicants' perceived enjoyment. The results of this study suggest that candidates who felt comfortable with gamification tools reported high face and predictive validity, an opportunity to demonstrate their skills, and enjoyment.

Georgiou (2021) conducted two studies to examine applicants' perceptions of fairness toward gamified-based situational judgment tests and the influence of explanations on perceptions of fairness. In the results of the first study, the author found that the gamified situational judgment test has low face and predictive validity compared to the traditional version "text." This can be explained by the lack of scenarios related to real work situations when gamification is integrated in traditional selection methods. In addition, Candidates have similar opportunities to demonstrate their skills with both gamified and text forms of the situational judgment test.

Regarding the results of the second study, it was found that the gamified situational judgment test is perceived as fair compared to its "text" version when the organization provides explanations about the purpose and reason for using the test. In addition, candidates who reported a high level of favorability towards the gamified situational judgment test will have positive perceptions towards the organization and will be more likely to recommend the organization to other candidates, which is not the case for the text version of the situational judgment test.

Overall, the role of explanations is crucial in improving candidates' perceptions of fairness toward selection tools that rely on gamification. Applicants tend to form positive justice perceptions when they are given explanations about the use of these tools. Another quantitative study was conducted in Greece to examine the impact of gamified situational judgment test on candidates' reactions and perceptions of fairness (perceptions of fairness, predictive validity, satisfaction), as well as organizational attractiveness in comparison compared to the classic version of the test (Georgiou & Nikolaou, 2020). The results showed that the inclusion of gamification elements in the Situational Judgment

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Test-Text (SJT) leads to greater satisfaction among candidates, which positively impacts their reactions and perceptions of fairness, as well as their attraction to the organization. However, the introduction of gamification does not affect candidates' perceptions of predictive validity, as they perceive both versions of the test (gamified and text) similarly.

Technology acceptance model

The Technology Acceptance Model was introduced by David in 1989. It posits that the attitudes and intentions of using a system are shaped by two main factors: ease of use and usefulness. The ease of use factor refers to the ease of operation and effort required to use a system, while the usefulness factor refers to the system's ability to benefit the user and improve their performance. The model is known for its simplicity and accuracy in predicting and explaining acceptance levels of technology (Davis, 1989, p. 320). According to the model, there is a direct correlation between perceived usefulness and perceived ease of use, meaning that users are more likely to consider a technology useful when it is also user-friendly (Bourgonjon et al., 2010, p. 1146). This model has been utilized by researchers in the field of recruitment and selection to explain applicants' perceptions of fairness towards gamification tools.

Buil, Catalán and Martínez (2020) examined Spanish applicants' perceptions of fairness towards gamification tools, specifically simulation games, based on the technology acceptance model. The results of their study showed that participants' perceptions of usefulness and ease of use of the selection tool were positively correlated with their levels of autonomy and competence. In other words, when participants felt autonomous in completing tasks via the gamification tool and were able to easily complete assigned tasks and assignments, they viewed the tool as both useful and easy to use. Similarly, Bourgonjon, Valcke, Soetaert and Schellens (2010) conducted a study in Belgium to investigate the level of acceptance of video games among 858 secondary school students in 20 schools. The study validated the technology acceptance model and found that perceptions of ease of use and usefulness were key drivers of students' perceptions of favorability towards video games.

Laumer, Eckhardt and Weitzel (2012) conducted a study in Germany to investigate applicants' reactions and perceptions of fairness towards serious games used by companies. The authors found that applicants' perceptions of fairness towards serious games were directly influenced by their perceptions of the games' usefulness and ease of use. Overall, these studies highlight the importance of the technology acceptance model in understanding how perceptions of usefulness and ease of use influence perceptions of fairness towards gamification tools in recruitment and selection.

Methodology

To ensure the reliability of our systematic review, we used the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) search protocol, which allowed us to identify search terms, databases, and eligibility criteria.

Search strategy, data source and procedure

Regarding the eligibility criteria of this systematic review, we selected five exclusion criteria and one inclusion criterion. First, we excluded scientific articles published before 2010 since our research objective is to evaluate recent research. In addition, we decided to include only journal articles, review articles, and conference papers. The goal is to focus on the types of articles that could help us develop an understanding of our research topic

as opposed to other types of articles that do not add value, such as white papers, doctoral dissertations, books, and book chapters. Second, we excluded all scientific articles published in languages other than French and English since best-quality scientific articles are published in English, with a minority of articles in French.

Afterward, other references were excluded because they did not meet our research objective. Therefore, our systematic review did not consider all articles that are off-topic and do not address the concept of gamification and its application in the field of recruitment and personnel selection. These articles focus on the application of gamification in the field of professional training and education.

Finally, our last exclusion criterion is related to the study population of the articles identified on the different scientific databases. Given that our research objective is to examine the application of gamification tools in the context of personnel selection as well as the study of candidates' reactions and perceptions of fairness towards these tools, we decided to retain only articles whose study population is composed of job seekers and exclude articles whose study population is composed of university students.

Regarding the source of data, we identified research articles that examined the role of game-based approaches (gamification, gamified assessment, game-based assessment) in the field of recruitment and personnel selection through a search of bibliographic references that was conducted in 5 scientific databases, which are Scopus, Web of Science, JSTOR, science direct and cairn. The data collection of scientific articles was conducted in April 2022. We used the following query for a first identification of references taking into account keywords related to the field of game-based approaches and keywords specific to the field of human resources. (gamification OR "gamified assessment" OR "serious games") AND (applicants OR candidates OR employees OR students) AND (selection OR reactions OR assessment OR perceptions). This search query was used for all scientific databases except the "ScienceDirect" database, which did not allow using more than eight Boolean connectors.

Data coding and theme organization

After identifying the articles that would constitute the qualitative synthesis based on the exclusion and inclusion criteria, we classified the selected articles by year of publication. The articles were then coded by number. Then, we classified all the articles in a synthesis table by mentioning the name of the authors, the title of the article, the year of publication, the sample size, the type of article, the country, and the main results. Finally, we read each article in detail in order to classify the articles read by topic. The main ideas, results, and research objectives allowed us to identify four main themes, with each article falling into a specific theme.

Results

Study selection

Following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) method, we identified 4 steps to conduct this systematic review. In the first phase, we identified 5,260 references via 5 scientific databases using the "Zotero" software (Scopus, Web of Science, JSTOR, ScienceDirect, Cairn). Then, 13 references were added through other sources since they meet our research objectives.

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The second phase consists in selecting the references after deleting all the duplicates. We removed the duplicates with the assistance of Excel software and retained 5,212 references. Next, we deleted 5,183 references based on the 5 predefined exclusion criteria. This exclusion allowed us to keep 29 full articles that will be studied for eligibility.

In addition, we excluded 8 additional references for three reasons: six articles were excluded because they opted for a less rigorous approach with little detail on the content of the articles. Also, one article was excluded because it was a systematic review. Finally, one article was excluded because we could not access the full text.

In the final inclusion phase, 21 articles were selected for the qualitative synthesis. These studies will be critically analyzed for content to identify the main themes of this systematic review. The authors read each article, and we noted all information about the research topic, the methodology used, and the authors on an Excel sheet.

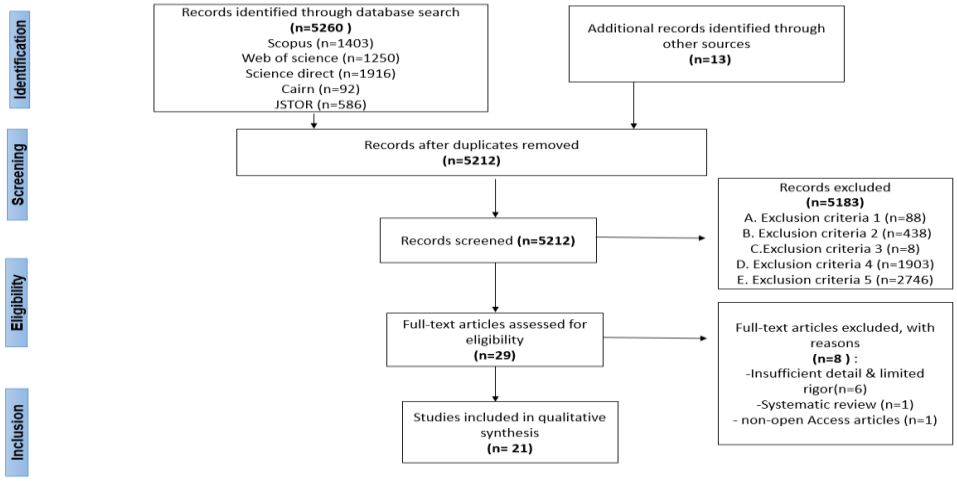

Figure 1. PRISMA flow diagram
Source: Mateo (2020, p. 34)

Study characteristics

Table 1 summarizes the characteristics of the studies that examined game-based approaches (GBA) and their application in personnel selection. Most empirical studies were conducted in different contexts, especially in Greece and the United States. The majority of the studies used a large sample size, which allows for better scientific validity of the data and generalization of the results. Since most scientific articles were published in 2021-2022, we could not access a scientific article published in January 2022 even after contacting the authors.

Game-based approaches (GBA) in personnel selection is a hot topic examined in Europe, Asia, North America, and Africa. Greece is the country in which several research papers have been reviewed. Most papers are empirical, using a quantitative research approach, with a minority of theoretical papers.

In addition, all articles are journal articles except for two articles (conference article, symposium article). Of the studies included in the qualitative synthesis, 18 articles (86%) were empirical, 2 articles (9%) were conceptual, and one article (5%) was a narrative literature review. Of the 18 empirical articles, 17 used a quantitative approach to test the research hypotheses, and one used a qualitative approach using in-depth interviews.

Table 1. Characteristics of included studies

Ref.	Author's name	Title	Year	Sample size	Methodology	Country
1	Mahrukh Khan, Hira Rehman Shaikh, Ahmed Mustafa, Abdul Ghafoor Kazi	Willingness of Gamified Recruitment and Selection among Job Seekers of Sindh, Pakistan	2019	118 job seekers	Quantitative approach	Pakistan
2	Isabel Buil, Sara Catalán, Eva Martínez	Understanding applicants' reactions to gamified recruitment	2020	239 applicants	Quantitative approach	Spain
3	Sven Laumer, Andreas Eckhardt, Tim Weitzel	Online Gaming to Find a New Job — Examining Job Seekers' Intention to Use Serious Games as a Self-Assessment Tool	2012	1882 participants in an online survey	Quantitative approach	Germany
4	Richard N. Landers, Elena M.Auer ,Joseph Abraham	Gamifying a situational judgment test with immersion and control game elements: Effects on applicant reactions and construct validity	2020	240 participants	Quantitative approach	USA
5	Panagiotis Gkorezis, Konstantina Georgiou, Ioannis Nikolaou, Anna Kyriazati	Gamified or traditional situational judgement test? A moderated mediation model of recommendation intentions via organizational attractiveness	2020	161 participants	Experimentation by simulation (based on scenarios)	Greece
6	Constantin Valentina-Daniela, Stoenescu Roxana-Denisa	Gamification in the recruitment process: studying Romanian potential employees' perception	2015	97 potential employees	Quantitative approach	Romania
7	Yaseerah Akoodie	Gamification in psychological assessment in South Africa: A narrative review	2020	-	Narrative review	South Africa
8	Konstantina Georgiou, Athanasios Gouras, Ioannis Nikolaou	Gamification in employee selection: The development of a gamified assessment	2019	Study 1: 321 participants. Study 2: 410 participants.	Quantitative approach	Greece
9	Dan Florin Stănescu, Cătălin Ioniță, Ana-Maria Ioniță	Game-thinking in Personnel Recruitment and Selection: Advantages and Disadvantages	2020	-	Theoretical article	Romania
10	Andrew B. Collmus, Richard N. Landers	Game-Framing to Improve Applicant Perceptions of Cognitive Assessments	2019	Study 1: 358 participants. Study 2: 354 participants	Quantitative approach	USA
11	Leah Joyce Ellison, Tara McClure Johnson, David Tomczak, Alina Siemsen, Manuel Francisco Gonzalez	Game on! Exploring reactions to game-based selection assessments	2020	374 participants « Amazon Mechanical turk »	Quantitative approach (Experimentation by simulation)	USA
12	Konstantina Georgiou	Can explanations improve applicant reactions towards gamified assessment methods?	2021	Study 1: 103 employees. Study 2: 186 employees.	Quantitative approach	Greece
13	Konstantina Georgiou,	Are applicants in favor of traditional or gamified assessment	2020	Study 1: 154 participants.	Quantitative approach	Greece

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	Ioannis Nikolaou	methods? Exploring applicant reactions towards a gamified selection method		Study 2: 131 participants.		
14	Anna Godollei, Derek S. Chapman	Gamified Cognitive Assessments in Selection; Validity, Discrimination and Applicant Reactions	2017	159 participants	Quantitative approach (Experimentation by simulation)	Canada
15	Ioannis Nikolaou, Konstantina Georgiou, Vasiliki Kotsasarlidou	Exploring the Relationship of a Gamified Assessment with Performance	2019	193 participants	Quantitative approach	Greece
16	Isabel Buil, Sara Catalán, Raquel Ortega	Gamification and Motivation: New Tools for Talent Acquisition	2019	239 participants	Quantitative approach	Spain
17	Dan Florin Stănescu, Adrian Tosca, Cătălin Ioniță	Game-based assessment – the new revolution of candidates' assessment	2018	-	Theoretical article	Romania
18	Isabelle Galois-Faurie, Alain Lacroux	« Serious games » et recrutement : quels enjeux de recherche en gestion des ressources humaines ?	2014	8 experts in the design of serious games and multimedia solutions	Qualitative approach (Interviews)	France
19	Klaus G. Melchers, Johannes M. Basch	Fair play? Sex-, age-, and job-related correlates of performance in a computer-based simulation game	2021	1071 applicants	Quantitative approach	Germany
20	Colin Willis, Tracy Powell-Rudy, Kelsie Colley, Joshua Prasad	Examining the Use of Game-Based Assessments for Hiring Autistic Job Seekers	2021	586 participants	Quantitative approach	USA
21	Björn Hommel, Regina Ruppel, Hannes Zacher	Assessment of cognitive flexibility in personnel selection: Validity and acceptance of a gamified version of the Wisconsin Card Sorting Test	2021	180 participants	Quantitative approach	Germany

Source: own elaboration

Discussion

Our systematic review allowed us to identify four main themes discussed in the literature of gamification and its application in personnel selection. The first theme relates to candidates' reactions and perceptions towards gamification tools and serious games. First, we found that the variable "gender" influences the change in candidates' perceptions towards gamification tools. Men perceive the application of gamification in the selection process favorably compared to women. This was confirmed by a few studies that stated that women perceive gamification tools negatively since they do not detect the candidates' skills "entertainment tool," and the comfort level of female gender candidates is low compared to male gender candidates whose comfort level is high (Khan et al., 2019; Ellison et al., 2020). Additionally, Gamification tools have a high level of reliability compared to traditional selection tools. The results of some studies claim that gamification can assess several soft skills, such as diligence, self-control, and task orientation (Constantin & Stoenescu, 2015; Georgiou, Gouras, & Nikolaou, 2019; Khan et al., 2019; Nikolaou, Georgiou, & Kotsasarlidou, 2019).

There is also a positive correlation between candidates' attitudes toward gamification and their level of satisfaction, recommendation intentions, and organizational attractiveness. In addition, applicants' perceptions of gamification tools are influenced by their perceptions of the ease of use and usefulness of the gamified selection tool. Results from some studies indicate that participants' level of autonomy and competence correlate with their perceptions of the selection tool's usefulness and ease of use. This means that when participants feel that they are autonomous in terms of completing tasks via the gamification tool/able to easily complete the tasks & assignments assigned to them, they perceive the tool's usefulness and ease of use positively as a result (Buil, Catalán, & Martínez, 2020; Laumer, Eckhardt, & Weitzel, 2012).

The second theme covers research articles that have examined applicants' reactions to the use of gamified selection tests. In terms of analysis of empirical studies that have investigated this research theme, we found no influence of gamified situational judgment tests on applicants' perceptions of fairness and attractiveness to the organization (Landers, Auer, & Abraham, 2020, p. 13). Second, the use of gamified selection tests contributes to a high level of favorability of candidates compared to traditional selection tests. Consequently, candidates will perceive the organization as innovative and trendy (Gkorezis et al., 2020; Landers, Auer, & Abraham, 2020).

On the other hand, the "experience" variable influences the change in candidates' recommendation intentions and their level of attractiveness to the organization. Candidates' recommendation intentions tend to be negative for those who are not familiar/comfortable with gamification tools or web technologies in general (Gkorezis et al., 2020, p. 8).

Furthermore, applicants' reactions and perceptions of fairness toward the two versions of a "Gamified or traditional" selection test are unchangeable. These reactions change when the control variables are present (experience with the gamification tool, for example) or when candidates are given sufficient explanations about the use of the gamified selection tool, hence the crucial role of explanations in improving candidates' perceptions towards selection tools that are based on gamification (Georgiou, 2021, p. 11). The third theme relates to the performance of candidates in a gamification-based selection process. Research studies that have examined this research theme affirm the role of gamified selection tools in predicting job performance. These tools measure candidates' soft skills (adaptability, flexibility, decision-making) (Nikolaou, Georgiou, & Kotsasarlidou, 2019, p.6). moreover, the variable "gender" influences candidates' performance in a gamified selection process (Melchers & Basch, 2021, p. 56).

The final theme is to present research articles examining gamification's benefits and limitations. Using gamification in the personnel selection process reduces the level of stress and anxiety of candidates and increases their motivation and involvement (Akoodie, 2020, p. 4). In addition, gamified selection tools can detect specific soft skills that are undetectable via traditional selection tools (Stanescu, Tosca, & Ioniță, 2018; Mislevy et al., 2014).

In addition, gamification tools give companies more objective answers since the candidates are immersed in the game. Therefore, the answers will be difficult to falsify (Tosca et al., 2019, p. 157). However, applying gamification tools in the personnel selection process requires significant financial resources and implementing the right design to ensure the validity and reliability of these tools (Stanescu, Tosca, & Ioniță, 2018, p. 485).

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Conclusions

The research objective was to review and evaluate the existing literature on game-based approaches in human resources and, more specifically, in personnel selection and to propose avenues for future researchers. The results of this systematic review affirmed the predominance of research articles related to candidates' reactions to gamified selection tests and the use of gamification and serious games in recruitment and personnel selection.

A limited number of articles have provided a comprehensive review of gamified selection tools compared to traditional selection methods. This study contributes to the literature by highlighting the main benefits and limitations of gamification and candidates' reactions and perceptions towards game-based approaches (GBA) in different contexts.

Implications for future research

After collecting and evaluating 21 research articles, we identified some aspects for future research. Seven scientific articles have investigated candidates' reactions and perceptions towards applying gamification and serious games in personnel selection. These studies have allowed us to become familiar with gamification and its use in personnel selection. Still, we will need further empirical research to understand this phenomenon in other contexts yet to be explored. Furthermore, we encourage other researchers to conduct qualitative & longitudinal studies as there are no longitudinal studies on this area of research nor an exploratory qualitative study that has examined candidates' reactions and perceptions of fairness towards game-based approaches (GBA). These types of studies will contribute to expanding the literature.

On the other hand, eight scientific articles have examined candidates' reactions to gamified selection tests (aptitude tests, situational judgment tests) and the organizational consequences of fairness perceptions (organizational attractiveness, recommendation intentions). This research has added significant value to the existing literature. However, there need to be more studies that have compared traditional and gamified selection methods. Evidence of this will ensure the continuity and expansion of the research.

In addition, we encourage research studies that could examine the influences of certain control variables (age, gender, experience with web technologies) on the change in candidates' perceptions of gamification tools. The goal is to confirm the results of other research that has already investigated the impact of control variables on changes in candidates' perceptions.

Limitations

This systematic review has some limitations that should be noted. First, we had a problem accessing the data since we could not access a recent article that the authors refused to share. The article in question meets our selection criteria and may contribute to a good understanding of the existing literature. Second, this systematic literature review was based solely on French and English literature, which is not representative of other contexts. However, during our research, we found a few articles written in Turkish and German that address the topic of gamification and its application in the context of recruitment and personnel selection. Finally, there is a scarcity of previous research that has examined game-based approaches and their use in the recruitment process. While identifying research articles that meet our inclusion and exclusion criteria, the number of articles selected is small.

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